

Surveillance after Colorectal Polypectomy; Comparison Between Japan and U.S.

SHINWA TANAKA¹, DAISUKE OBATA¹, RYO CHINZEI¹,
SHIEI YOSHIDA¹, TUYOSHI SANUKI¹, YOSHINORI MORITA¹,
MASARU YOSHIDA^{1,2}, TSUYOSHI FUJITA¹, TAKASHI TOYONAGA¹,
HIROMU KUTSUMI¹, HIDETO INOKUCHI¹, and TAKESHI AZUMA^{1*}

¹ Division of Gastroenterology, Department of Internal Medicine, Graduate School of Medicine, Kobe University, 7-5-1 Chu-o-ku, Kusunoki-Cho, Kobe, Hyogo 650-0017, Japan

² The Integrated Center for Mass Spectrometry, Graduate School of Medicine, Kobe University, 7-5-1 Chu-o-ku, Kusunoki-Cho, Kobe, Hyogo 650-0017, Japan

Received 27 May 2010/ Accepted 1 July 2010

Key Words: polypectomy, surveillance, colonoscopy, recommendation

ABSTRACT

Background

Recently, early detection and early treatment of the colorectal cancer have been enabled by the improvement of endoscopic diagnosis and introduction of new techniques. In Japan, although Japan Polyp Study is running, there is no standard strategy concerning the post-polypectomy colonoscopic surveillance yet. Post-polypectomy colonoscopic surveillance is so far entrusted to each institute or each gastroenterologist at present.

Material and method

To analyze the present states of the surveillance after polypectomy in Japan, we performed questionnaire survey and compared them with the results in U.S. and U.S. Multisociety Task Force on colorectal Cancer. A simple random sample of 132 doctors who engaged in a digestive organ disease in plural institutes was obtained.

Result

Many doctors recommend surveillance every around 1 year regardless of the kind of the polyp. Doctors in Japan tend to recommend postpolypectomy colonoscopic surveillance more frequently than that recommended U.S. Multisociety Task Force on colorectal Cancer. Furthermore in all types of polyps except for 12 mm tubular adenoma with high grade dysplasia, the majority of doctors in Japan recommend post-polypectomy colonoscopic surveillance more frequently than American doctors. Significant difference was found in surveillance of hyperplastic polyp among doctors with 1 to 5 years experience and those with more than 6 years.

Conclusion

It has been shown that surveillance intervals varies substantially in each doctor. The agreement of the surveillance program in Japan is necessary to standardize the strategy for the post-polypectomy surveillance of the colon.

SURVEILLANCE AFTER POLYPECTOMY

INTRODUCTION

Adenomatous polyps are the most frequent neoplasm found in colorectal screening (1-4). Removal of these lesions has been shown to reduce the risk of colorectal cancer (5-12). Recently, the indication of endoscopic resection for colorectal tumor has been expanded by development of endoscopic procedures, which has made it possible to treat not only small polyps but also submucosal invasive colorectal carcinoma. The number of post-polypectomy colonoscopic surveillance is increasing rapidly and inevitably causing the limitation for the management of screening colonoscopy, which has become crucial issue to be solved (13,14).

In the U.S., it was common practice in the 1970s for the patients with adenomas to have annual follow-up surveillance to detect additional new adenomas as well as missed synchronous adenomas. As a result of the National Polyp Study report in 1993 (15), which demonstrated clearly in a randomized design that the first postpolypectomy examination could be deferred for 3 years, guidelines published by a gastrointestinal consortium in 1997 recommended that the first follow-up surveillance should be carried out 3 years after polypectomy for most patients. However, it has become clear that postpolypectomy surveillance is now a large part of endoscopic practice, and is draining resources from the screening colonoscopy. In 2003, these guidelines were updated by Winawer et al (13). In case of a patient with adenoma, reexamination in short term after first polypectomy is recommended if a patient is a case having multiple adenomas or cancer. Reexamine within 3 years should be carried out when there are more than three polyps or cellular atypia is high. If there are one or two small polyps, reexamination can be deferred until five years. It is, however, stated that further evidence is necessary about appropriate interval and it is very likely that new revise will be performed in the future. When there is no risk (no polyp or a few small polyps) at the first examination, an extension to five years is possible. In the guideline of Winawer et al. of 2006, it was able to classify the patients into two groups; low risk group and high group risk group of the adenoma development (14). Specifically high risk group was prescribed with a patient having adenomas more than 3, high grade dysplasia, tubulovillous adenoma or adenoma more than 10 mm in diameter. A patient of this group was recommended to undertake a colonoscopy after 3 years. In contrast, in case of low risk group with 1 or 2 tubular adenoma (less than 10 mm in diameter) without high cellular atypia, endoscopic surveillance interval was recommended in 5 to 10 years.

MATERIAL AND METHOD

Survey Development

The questionnaires included the following clinical scenario. The patient was a 55-year-old man in good health who underwent a screening colonoscopy. The colonoscopy was completed to the cecum, the quality of the colon cleansing was excellent, and the patient had no family history of colon cancer. The colonoscopic finding of this patient was assumed to include a 6-mm hyperplastic polyp, one or two 6-mm tubular adenomas, a 12-mm tubulovillous adenoma, or a 12-mm tubular adenoma with a focus of high-grade dysplasia. Another vignette included a 55-year-old man who had undergone polypectomy of a 12-mm tubular adenoma on screening 3 years ago, and no polyp was found by latest surveillance colonoscopy. The practitioners were asked to select the follow-up interval that they would recommend from the following choices: colonoscopy at 6 months, 1 year, 3 years, 5 years, 10 years, or no repeated colonoscopy.

Recruitment

A simple random sample of 132 doctors who engaged in a digestive organ disease in plural institutes was obtained.

Statistical Analysis

All analyses for statistically significant differences were performed with the chi-square test. A P value less than 0.05 was considered statistically significant for any difference in answers between groups to correct for multiple comparisons between groups.

RESULTS

Characteristics of Survey Respondents

The overall response rate was 99.2% (131/132). One hundred thirty-one responses were received. Table I shows characteristics of the respondents.

Table I. Characteristic of Survey Respondents

Characteristics	Doctors, n (%)
Overall	131
Sex	
Male	111 (84.7)
Female	20 (15.3)
Year in practice	
<5	11 (8.3)
5-10	40 (30.5)
11-20	36 (27.5)
>20	44 (33.6)

Follow-up Recommendation

Table II shows the results of follow-up recommendation by each respondent according to the clinical scenario described above.

Low-risk lesions include a single hyperplastic polyp, a single tubular adenoma, two tubular adenomas and no polyp but a previous tubular adenoma. The follow up interval recommended by responders were 1 and 3 years later in a single 6mm hyperplastic polyp. No repeated colonoscopy was recommended in 24.4%. In a single 6mm tubular adenoma and two tubular adenomas, recommended interval was mostly 1 year. No significant differences were found in surveillance between a single 6mm tubular adenoma and two 6mm tubular adenomas. The majority of doctors recommend the follow-up colonoscopy three years later in case of no polyp but a previous tubular adenoma (Table II).

High-risk lesions include tubular adenoma with high grade dysplasia and tubulovillous adenoma. The majority of doctors recommend the next follow-up colonoscopy three years later in both cases when no polyp was found at 1 year-postpolypectomy follow-up of a single 12mm tubulovillous adenoma and 6-month follow-up in 12mm tubular adenoma with high-grade dysplasia. No significant differences were founded in surveillance about 12mm tubulovillous adenoma and 12mm tubular adenoma with high-grade dysplasia (Table II). Comparing high-risk lesions with low-risk lesions, significant difference was found between 2 groups (Figure 1). Many doctors tended to recommend the surveillance more than 1 year in low-risk lesions and within 1 year in high-risk lesions.

SURVEILLANCE AFTER POLYPECTOMY

Table II. The results of follow-up recommendation

Critical Scenario	Doctor Who Recommend Surveillance, n (%)					
	In 6 month	In 1 year	In 3 years	In 5 years	In 10 years	No repeated
6mm hyperplastic polyp	1 (1)	41 (31)	41 (31)	17 (13)	0 (0)	31 (24)
6mm tubular adenoma	12 (9)	86 (66)	29 (22)	0 (0)	0 (0)	4 (3)
12mm tubular adenoma with high grade dysplasia	69 (53)	58 (44)	1 (1)	3 (2)	0 (0)	0 (0)
12mm tubulovillous adenoma	18 (14)	101 (77)	11 (8)	0 (0)	0 (0)	1 (1)
Two 6mm tubular adenomas	10 (8)	96 (73)	22 (17)	0 (0)	0 (0)	3 (2)
No polyps in a patient with a 12mm tubular adenoma 3 years earlier	1 (1)	25 (19)	80 (61)	12 (9)	3 (2)	10 (8)

The experience in practice of doctors

To analyze how the recommendation of surveillance differs by the years in clinical practice of doctor, we divided these doctors into 2 groups, whose experience were 1 to 5 years and those more than 6 years. We also analyzed by the number of the polyp and the pathology. No significant differences were found in surveillance as for the number of polyps, high grade dysplasia or adenoma according to the experience of doctors (Figure 2 and 3). Statistically significant difference was found in surveillance of hyperplastic polyp between doctors with 1 to 5 years experience and those with more than 6 years (Figure 3).

Comparison with the result in Japan and U.S.

We compared the result in Japan with that in U.S. (Boolchand V et al. Colorectal Screening after Polypectomy: A National Survey Study of Primary Care Physicians. *Ann Intern Med.* 2006 Nov 7;145(9):654-9.). The results were compared according to them in U.S. dividing into within in one year, in three years, in five years and over five years. Within in one year include 6 months and 1 year, and over 5 years include 10 years and no repeated. Table III shows the results in Japan and U.S.. The surveillance for a single 6 mm hyperplastic polyp in Japan was recommended more frequently than in US. Statistically significant difference was found in surveillance of a single 6 mm hyperplastic polyp between Japan and U.S.. Although USMSTF for a single 6 mm hyperplastic polyp was ten years, many of Japanese and U.S. doctors recommended shorter interval than USMSTF. The surveillance for a single 6 mm tubular adenoma and two 6 mm tubular adenomas in Japan were recommended more frequently than in U.S.. Statistically significant differences were found in surveillance of a single 6 mm tubular adenoma and two 6mm tubular adenomas between Japan and U.S.. Although USMSTF for hyperplastic polyp was five to ten years, many of Japanese and U.S. doctors recommended shorter interval than USMSTF. The surveillance for a single 12 mm tubulovillous adenoma in Japan was recommended more frequently than in U.S.. Statistically significant differences were found in surveillance of a single 12 mm tubulovillous adenoma between Japan and U.S.. No significant differences were found in surveillance for 12mm tubular adenoma with high grade dysplasia between Japan and U.S.. The surveillance for the cases with no polyp but a previous tubular adenoma was recommended more frequently in Japan than in U.S.. Statistically significant differences were found in surveillance in case of no polyp but a previous tubular adenoma between Japan and U.S.. USMSTF for in no polyp but a previous tubular adenoma was five years. Although many of U.S. doctors recommended according to USMSTF, many doctors in Japan ordered shorter interval than USMSTF.

Table III. The results in Japan and U.S

Critical Scenario	2006 U.S. Multisociety Task Force recommendation	Japanese Doctor Who Recommend Surveillance, %			
		U.S. Doctor Who Recommend Surveillance, % *			
		In ≤1 Year	In 3 Years	In 5 Years	In >5 Years
6mm hyperplastic polyp	10 years	32	31	13	24
		16	16	29	35
6mm tubular adenoma	5~10 years	75	22	0	3
		25	46	23	3
12mm tubular adenoma with high grade dysplasia	3 years	97	1	2	0
		85	12	2	1
12mm tubulovillous adenoma	3 years	91	8	0	1
		59	33	6	1
Two 6mm tubular adenomas	5~10 years	81	17	0	2
		37	43	15	1
No polyps in a patient with a 12mm tubular adenoma 3 years earlier	5 years	20	61	9	10
		2	21	57	18

*: Boolchand V et al. Colorectal Screening after Polypectomy: A National Survey Study of Primary Care Physicians. Ann Intern Med. 2006 Nov 7;145(9): 654-9.

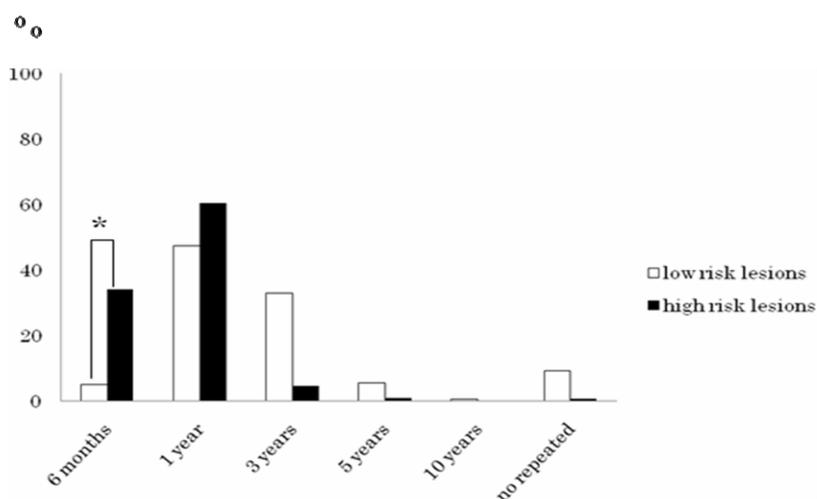


Figure 1. Follow-up intervals in low-risk and high-risk lesions

Significant difference was found in surveillance between low-risk and high-risk lesions. The presence of significant differences is indicated by asterisks. (m×n Chi squer test P=0.016)

SURVEILLANCE AFTER POLYPECTOMY

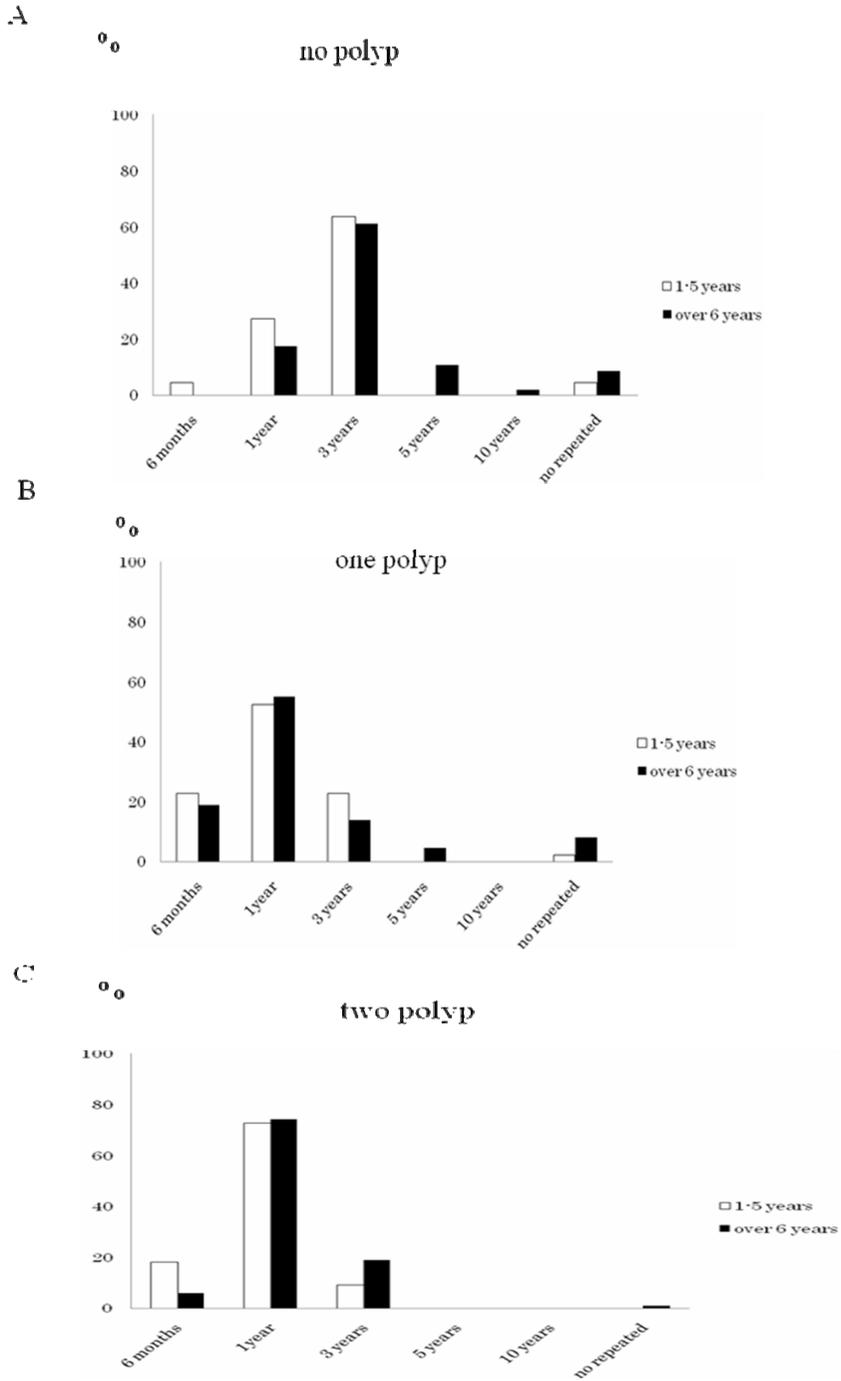


Figure 2. The comparison of the year in practice of doctors, in relation to the number of polyps. (A. no polyp, B. one polyp, C. two polyps) No significant differences were found in surveillance as to the number of polyps according to the experience of doctors.

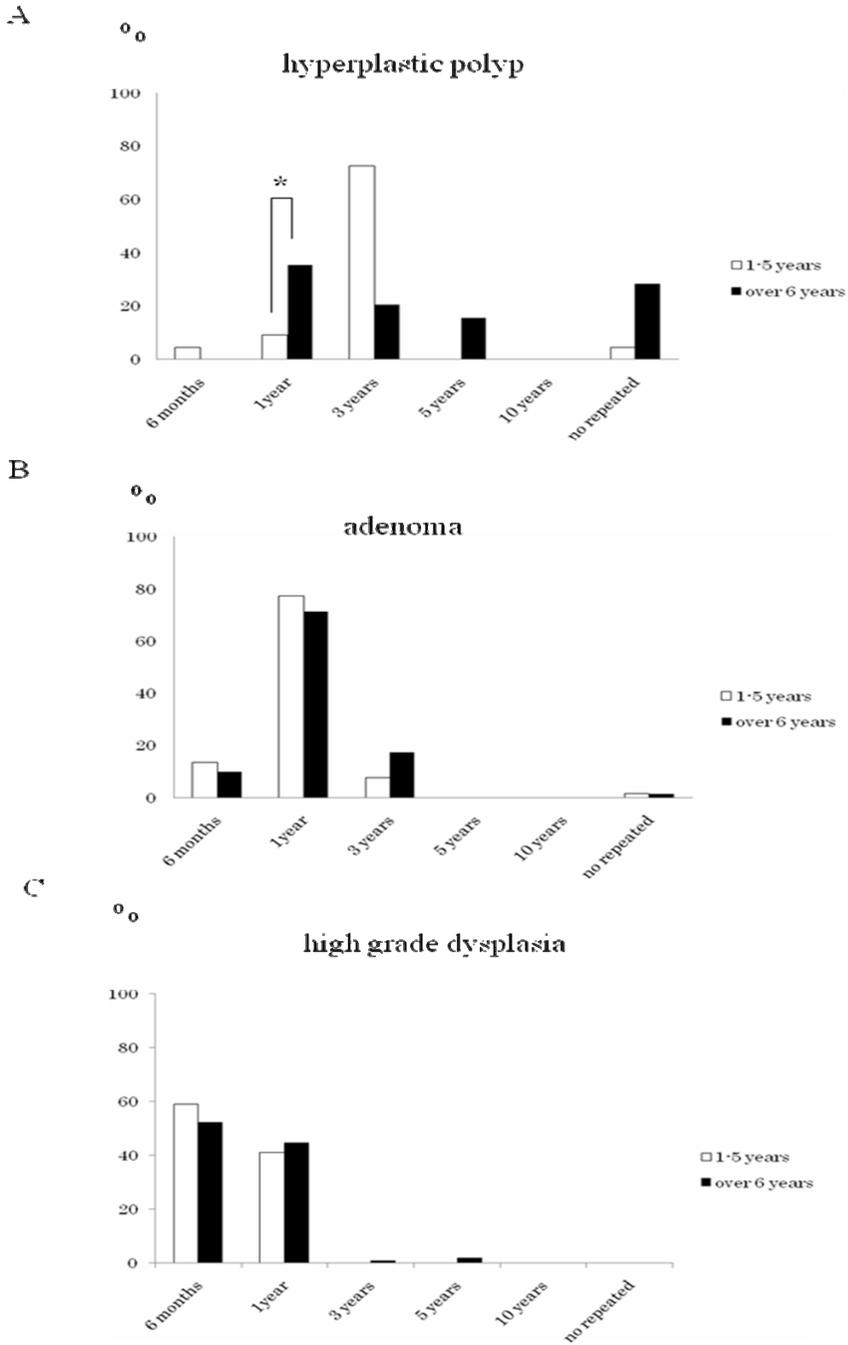


Figure 3.The comparison of the year in practice of doctors, in relation to pathology. (A. hyperplastic polyp, B. adenoma, C. high grade dysplasia) No significant differences were found in surveillance about high grade dysplasia or adenoma according to the experience of doctors. Statistically significant difference was found in surveillance of hyperplastic polyp between doctors with 1 to 5 years experience and those with more than 6 years. The presence of significant differences is indicated by asterisks. (m×n Chi squer test P<0.001)

SURVEILLANCE AFTER POLYPECTOMY

DISCUSSION

In Japan, according to the official reports of death rates by vital statistics in 2005 of Ministry of Health, Labour and Welfare, the colorectal cancer was the fourth cause in male and the first cause in female among the death by malignancies. National expense for the colorectal cancer rises from such a background, and the number of screening colonoscopy is strikingly increasing. In addition, early detection and early treatment of the colorectal cancer has been enabled by the improvement of endoscopy and the diagnosis, which subsequently causes substantial increase of the post-polypectomy colonoscopic surveillance. Therefore, the frame of guideline of surveillance colonoscopy in Japan becomes the important issue because the post-polypectomy colonoscopic surveillance bears on screening colonoscopy.

In U.S., as a result of the National Polyp Study report in 1993, the first follow-up surveillance is 3 years after polypectomy for most patients. In 2003, these guidelines were updated according to the report of meta-analysis in U.S.. This guideline was suggested that the first follow-up surveillance should be performed depending on the risk for subsequent adenomas.

In Japan, although Japan Polyp Study (JPS) is running(15), there is so far no agreement with the post-polypectomy colonoscopic surveillance. The JPS started in 2000, and its objective is to evaluate appropriate follow-up surveillance strategies for the colorectal cancer after the removal of all detected polyps with high-resolution chromoendoscopy, including the removal of flat or superficial depressed (0-IIc) lesion. The final result of JPS is going to be published in 2011. We found that many doctors at present tends to recommend surveillance every around 1 year regardless of the kind of the polyps. The doctors may cautiously recommend surveillance because there may be missed polyps and a local recurrence of cancer. One study has shown that the missing rate for adenoma may be substantial (up to 24%)(18). Another study has shown that the risk for subsequent neoplastic findings depend on the quality of initial examination.(19,20) The concern of clinicians for missed cancers can be assuaged by high-quality baseline performance of colonoscopy. It is believed that 76 to 90% reduction would be achieved with high confidence examination(21,22). When the high quality examination is performed in low risk group, it may be possible to lengthen the interval.

Comparing the experience in endoscopic practice, no significant differences were found in surveillance about the number of polyps, high grade dysplasia or adenoma but statistically significant difference was found in surveillance of hyperplastic polyp between doctors with 1 to 5 years experience and those with more than 6 years. The doctor with less experience recommended surveillance at short interval for hyperplastic polyp which is a non-tumor characteristics polyp. The doctors with less experience might recommend surveillance at short interval regardless of the kind of polyps, because they do not have confidence enough for their own examination and they lack knowledge about character of hyperplastic polyp.

In terms of comparison with the result in Japan and U.S., in all types of polyps except high grade dysplasia, the majority of doctors in Japan recommend postpolypectomy colonoscopic surveillance more frequently than American physician. There are some possible reasons for this result. One is that the number of endoscopists and hospitals to the population in Japan is more than US (23). Other is that Japanese endoscopists have a good skill for colonoscopy, therefore they might easily recommend surveillance at short time.

In summary, we found that in all types of polyps except high grade dysplasia, the majority of doctors in Japan recommend post-polypectomy colonoscopic surveillance more frequently than American physician. The number of post-polypectomy colonoscopic

surveillance is increasing and bear on screening colonoscopy at present. The establishment of the original surveillance program in Japan will be necessary in the future.

ACKNOWLEDGMENTS

This work was supported, in part, by a grant for the Global COE Program "Education Program for Specialized Clinician Support Program for Improving Graduate School Education" Ministry of Education, Culture, Sports, Science and Technology (T.A.) This work was also supported by a grant for the Education Program for Specialized Clinician in the Support Program for Improving Graduate School Education from the Ministry of Education, Culture, Sports, Science and Technology of Japan (S. T.).

REFERENCES

1. **Mandel JS, Bond JH, Church TR, Snover DC, Bradley GM, Schuman LM, Ederer F. et al.** 1993. Reducing mortality from colorectal cancer by screening for fecal occult blood. Minnesota Colon Cancer Control Study. *N Engl J Med* **328**: 1365-1371.
2. **Lieberman DA, Weiss DG, Bond JH, Ahnen DJ, Garewal H, Chejfec G. et al.** 2000. Use of colonoscopy to screen asymptomatic adults for colorectal cancer. Veterans Affairs Cooperative Study Group 380. *N Engl J Med*; **343**:162-168.
3. **Imperiale TF, Wagner DR, Lin CY, Larkin GN, Rogge JD, Ransohoff DF. et al.** 2000. Risk of advanced proximal neoplasms in asymptomatic adults according to the distal colorectal findings. *N Engl J Med*; **343**:169-174.
4. **Schoenfeld P, Cash B, Flood A, Dobhan R, Eastone J, Coyle W. et al.** 2005. Colonoscopic screening of average-risk women for colorectal neoplasia. *N Engl J Med*; **352**:2061-2068.
5. **Winawer SJ, Zauber AG, Ho MN, O'Brien MJ, Gottlieb LS, Sternberg SS, et al.** 1993. Prevention of colorectal cancer by colonoscopic polypectomy. The National Polyp Study Workgroup. *N Engl J Med*; **329**:1977-1981.
6. **F Citarda, G Tomaselli, R Capocaccia, S Barcherini, M Crespi.** 2001 The Italian Multicentre Study Group. Efficacy in standard clinical practice of colonoscopic polypectomy in reducing colorectal cancer incidence. *Gut*; **48**:812-815.
7. **Atkin WS, Morson BC, Cuzick J.** 1992. Long-term risk of colorectal cancer after excision of rectosigmoid adenomas. *N Engl J Med*; **326**:658-662.
8. **Thiis-Evensen E, Hoff GS, Sauar J, Langmark F, Majak BM, Vatn MH. et al.** 1999. Population-based surveillance by colonoscopy: effect on the incidence of colorectal cancer. Telemark Polyp Study I. *Scand J Gastroenterol*; **34**:414-420.
9. **Selby JV, Friedman GD, Quesenberry CP Jr, Weiss NS.** 1992. A case-control study of screening sigmoidoscopy and mortality from colorectal cancer. *N Engl J Med*; **326**:653-657.
10. **Newcomb PA, Norfleet RG, Storer BE, Surawicz TS, Marcus PM.** 1992. Screening sigmoidoscopy and colorectal cancer mortality. *J Natl Cancer Inst*; **84**:1572-1575.
11. **Newcomb PA, Storer BE, Morimoto LM, Templeton A, Potter JD.** 2003. Long-term efficacy of sigmoidoscopy in the reduction of colorectal cancer incidence. *J Natl Cancer Inst*; **95**:622-625.
12. **Bertario L, Russo A, Sala P, Pizzetti P, Ballardini G, Andreola S. et al.** 2003. Predictors of metachronous colorectal neoplasms in sporadic adenoma patients. *Int J Cancer*; **105**:82-87.
13. **Winawer S, Fletcher R, Rex D, Bond J, Burt R, Ferrucci J. et al.** 2003. Colorectal

SURVEILLANCE AFTER POLYPECTOMY

- cancer screening and surveillance: clinical guidelines and rationale-update based on new evidence. *Gastroenterology* **124**: 544-560.
14. **Winawer SJ, Zauber AG, Fletcher RH, Stillman JS, O'Brien MJ, Levin B. et al.** 2006. Guidelines for colonoscopy surveillance after polypectomy: a consensus updated by the US Multi-Society Task Force on Colorectal Cancer and the American Cancer Society. *Gastroenterology* **130**: 1872-1885.
 15. **Winawer SJ, Zauber AG, O'Brien MJ, Ho MN, Gottlieb L, Sternberg SS. et al.** 1993. Randomized comparison of surveillance intervals after colonoscopic removal of newly diagnosed adenomatous polyps. *N Engl J Med* **328**: 901-906.
 16. **Sano Y, Fujii T, Oda Y.** 2004. A multicenter randomized controlled trial designed to evaluate follow-up surveillance strategies for colorectal cancer: The Japan Polyp Study. *Digest Endosc* **16**: 376-378.
 17. **Boolchand V, Olds G, Singh J, Singh P, Chak A, Cooper GS. et al.** 2006. Colorectal Screening after Polypectomy: A National Survey Study of Primary Care Physicians. *Ann Intern Med.* Nov 7; **145(9)**:654-9.
 18. **Rex DK, Cutler CS, Lemmel GT, Rahmani EY, Clark DW, Helper DJ, et al.** 1997. Colonoscopic miss rates of adenomas determined by back-to-back colonoscopies. *Gastroenterology*; **112**: 24-8.
 19. **Rex DK, Bond JH, Winawer S, Levin TR, Burt RW, Johnson DA. et al.** 2002. Quality in the technical performance of colonoscopy and the continuous quality improvement process for colonoscopy: recommendations of the US Multi-Society Task Force on Colorectal Cancer. *Am J Gastroenterol* **97**: 1296-1308.
 20. **Barclay RI, Vicari JJ, Johanson JF, Greenlaw RI.** 2005. Variation in adenoma detection rates and colonoscopic withdrawal times during screening colonoscopy. *Gastrointest Endosc*; **61**: 100-107.
 21. **Winawer SJ, Zauber AG, Ho MN, O'Brien MJ, Gottlieb LS, Sternberg SS. et al.** 1993. Prevention of colorectal cancer by colonoscopic polypectomy. The National Polyp Study Workgroup. *N Engl J Med*; **329**:1977-1981.
 22. **Ransohoff DF.** 2005. Have we oversold colonoscopy? *Gastroenterology*; **129**: 1815.
 23. **Foster E., Fukami N.** 2008. *Clinical Gastroenterology*; **23**:259-262.